

REMARKS

This is a full and timely response to the non-final Official Action mailed **May 13, 2008** (the “Office Action” or “Action”). Reconsideration of the application in light of the above amendments and the following remarks is respectfully requested.

Claim Status:

By the forgoing amendment, claim 1 has been amended. Additionally, original claims 2-20 have been cancelled without prejudice or disclaimer, and new claims 21-39 have been added. Thus, claims 1, 21-39 are currently pending for further action.

Rejection under 35 U.S.C. §103(a):Claim 1:

Claim 1 was rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Publication No. 2002/0069263 A1 to Sears et al. (hereinafter “Sears”) in view of U.S. Patent No. 6,463,582 to Lethin et al. (hereinafter “Lethin”). For at least the following reasons, this rejection should be reconsidered and withdrawn.

Claim 1 now recites:

A method of optimizing the performance a virtual machine, the virtual machine adapted to run an application in the context of the runtime environment, the method comprising:

augmenting a bytecode set of the virtual machine with semantically enriched opcodes, thereby constituting an application domain-specific virtual machine;

performing a quantitative trade-off between execution time and memory space to determine effective semantically enriched opcodes and encoding the semantically enriched opcodes into interpreter action codes based upon the trade-off;

analyzing frequently executed bytecodes and encoding the semantically enriched opcodes into interpreter action codes of an instruction set of the virtual machine to efficiently decode frequently executed bytecodes;

optimizing the translation by the interpreter action codes of the semantically enriched opcodes according to a system state; and

statically embedding the semantically enriched opcode to optimize execution of the interpreter-based runtime system.
(Emphasis added)

Support for the amendment to claim 1 can be found in the Specification as originally filed by the Applicant at, for example, page 11, line 6 through page 12, line 3 and Fig. 6.

In contrast to claim 1, the cited prior art references, taken in any combination, fail to teach or suggest the claimed method including “optimizing the translation by the interpreter action codes of the semantically enriched opcodes according to a system state.” The cited prior art does not teach optimizing the translation of interpreter action codes as claimed *according to a system state*.

Under the analysis required by *Graham v. John Deere*, 383 U.S. 1 (1966) to support a rejection under § 103, the scope and content of the prior art must first be determined, followed by an assessment of the differences between the prior art and the claim at issue in view of the ordinary skill in the art. In the present case, the scope and content of the prior art, as evidenced by Sears and Lethin, does not include the claimed method, particularly “optimizing the translation by the interpreter action codes of the semantically enriched opcodes according to a system state.”

The difference between the prior art and claimed subject matter is significant because the incorporation of system states allows for additional optimization based on structural and operational constraints of the runtime environment. (Applicant’s specification, p. 11, lines 6-7). For example, a stack invariance constraint exists in many runtime environments. Stack invariance requires that each bytecode must only be executed with the appropriate number and type of arguments. By accounting for both the bytecode command and its execution context as represented by a system state, bytecode dispatch overhead is eliminated, stack

operands are folded, and redundant local variable access is eliminated (page 11, lines 9-20 and Fig. 6).

This optimization based on system states, with its accompanying features and advantages, is not disclosed or taught in the prior art. Consequently, the cited prior art will not support a rejection of claim 1 under 35 U.S.C. § 103 and *Graham*.

The newly added claims are thought to be patentable over the prior art of record for at least the same reasons given above with respect to original independent claim 1. Therefore, examination and allowance of the newly added claims is respectfully requested.

Conclusion:

In view of the foregoing arguments, all claims are believed to be in condition for allowance over the prior art of record. Therefore, this response is believed to be a complete response to the Office Action. However, Applicant reserves the right to set forth further arguments in future papers supporting the patentability of any of the claims, including the separate patentability of the dependent claims not explicitly addressed herein. In addition, because the arguments made above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed.

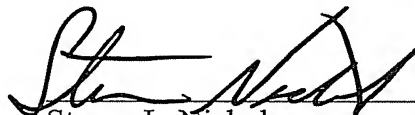
The absence of a reply to a specific rejection, issue or comment in the Office Action does not signify agreement with or concession of that rejection, issue or comment. Finally, nothing in this paper should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this paper, and the amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment. Further, for any instances in which the Examiner took Official Notice in the Office Action, Applicants

expressly do not acquiesce to the taking of Official Notice, and respectfully request that the Examiner provide an affidavit to support the Official Notice taken in the next Office Action, as required by 37 CFR 1.104(d)(2) and MPEP § 2144.03.

If the Examiner has any comments or suggestions which could place this application in better form, the Examiner is requested to telephone the undersigned attorney at the number listed below.

Respectfully submitted,

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